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PRELIMINARY REVISIONS OF SOME GENERA OF MALAYSIAN PAPILIONACEAE II *

by

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SUMMARY

The revisions or notes have been prepared by Miss M. S. van Meeuwen, except for those of *Pseudarthria* and *Sophora* by C. G. G. J. van Steenis, and *Tephrosia* by J. Stemmerik.

In *Alysicarpus* 4 species are distinguished in Malaysia; a key, synonymy, and discussion are given.

Lourea Desv., being a homonym, has, according to Dr. Bakhuizen van den Brink, to be replaced by *Christia;* a key and discussion is given of 4 Malaysian species; 5 new combinations are proposed.

Under *Desmodium* the variability of *D. heterocarpon* (L.) DC. and its full synonymy are discussed; one new variety is proposed; an enumeration of specimens of both varieties is given. *D. ormocarpoides* DC. and *D. zonatum* Miq. are two sharply distinct species which have been confused in the past; a key, synonyms, discussion, and enumeration of specimens are provided. The discrimination of *D. sequax* Wall. and *D. megaphyllum* Zoll. is discussed and their synonymy given; specimens have been enumerated. Distribution is given of *D. scorpiurus* (Sw.) Desv. and *D. tortuosum* (Sw.) DC.

Psoralea is revised for Malaysia where 4 species are recorded and keyed out; a fifth species must remain dubious, as the type could not be traced in the Paris Herbarium.

Of *Pseudarthria* only one species occurs in Malaysia; its synonymy and distribution is given.

Sophora longipes Merr., an endemic species from the Philippines, is recorded for Timor.

Of *Tephrosia maculata* M. & P., from Papua, the synonymy is given and specimens enumerated; *T. brachystachys* Laut. & K. Sch. is reduced. Notes and distribution are given of *T. zollingeri* Backer. For *T. mollis* Val., a later homonym, the new name *T. papuana* is proposed.

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The kind help of Dr. W.T. Stearn, London, with the examination of the type of *Desmodium heterocarpon* is very much appreciated. Miss D.

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Hillcoat, London, helped in checking the identity of *Tephrosia zollinge*. We could borrow and examine specimens from the Herbarium of t Royal Botanic Gardens, Kew, and the Muséum National d'Histoi Naturelle, Phanérogamie, Paris, and tender our thanks for this privile to the Directors of these Institutes, Dr. G. Taylor and M. A. Aubrévill Thanks are due to Dr. R.C. Bakhuizen van den Brink Jr for help wi the nomenclature of *Christia*. To him and to Dr. R.D. Hoogland, Canberra we express our gratitude for pointing out some errors in the text of th first instalment.

ALYSICARPUS Desv.

In this revision four species of *Alysicarpus* have been admitted f the Malaysian archipelago. Several specific names have been removed a they had been wrongly interpreted. Among the latter is *A. nummularifolius* (L.) DC. which had repeatedly been mentioned from Malaysia. I has appeared, however, that *Hedysarum nummularifolium* L. has since De Candolle wrongly been interpreted; this was already found out by Walker & Arnott in 1834. The type of it is a Hermann specimen described b Linnaeus in Fl. Zeyl. and it has appeared to be *Indigofera nummularifolia* (L.) Livera *ex* Alston. A good discussion has been given by Léonard (*in* Bull. Jard. Bot. Brux. 24: 84-102.1954).

Another species under dispute is *A. rugosus*, the delimitation of which as given by Schindler (*in* Fedde, Rep. 23: 71-127. 1927; Beih. 49. 1928) is unsatisfactory. Sedgwick has in a revision of the Indian species given a treatment of *A. rugosus* and its allied species in India and his key works well, except for *A. ludens*.

Ecologically the four species of *Alysicarpus* behave differently, though all avoid the damp rain-forest. Their response fits well with the distributional types presented in the first instalment: *A. vaginalis* is rather indifferent but prefers a slightly dry season; it belongs to drought class 1, see the map of *Smithia sensitiva*. *A. bupleurifolius* belongs to drought class 2, fitting the area of *Pycnospora lutescens*.

A. rugosus belongs to drought class 6 and its area is equiform to that of *Rhynchosia rothii*.

KEY TO THE SPECIES

1. Calyx lobes imbricate at the base. Stem glabrous except for a line of appressed erect hairs below each leaf, glabrescent.
2. Pod smooth, glabrous or vaguely reticulately rugose, articulated and contracted between the joints, protruding from the calyx. Racemes lax-flowered, elongated.

Calyx ciliate. Stipules 3—10 mm. Petioles 1—3 mm. Stems glabrous or nearly so. Leaflet 1, linear to broadly elliptic, 1—9 cm by 2—8 mm, glabrous above, thinly pubescent beneath . . . . . *2. A. bupleurifolius*

2. Pod transversely rugose, glabrous or nearly so, almost entirely enclosed in the calyx.

3. Racemes dense, stiff, terminal and lateral. Calyx ciliate, glabrous or hirsute all over; calyx lobes slightly obtuse. Stipules 4—11 mm. Petioles 2—7 mm. Leaflet 1(—2—3), broad elliptic to linear-lanceolate, ½—10 by ½—2½ cm, glabrous above, pubescent below, with longer hairs on nerves and margin, . . . *3. A. rugosus*

3. Racemes lax, slender, lateral. Calyx ciliate; calyx lobes acute. Stipules 3—6 mm. Petioles 2—5 mm. Leaflet 1, broadly elliptic, ½—3 by 0.3—1½ cm, slightly hairy on both sides, below especially on nerves and margin. . . . *4. A. timorensis*

1. Calyx lobes not or hardly imbricate at the base, slightly pubescent. Pod far extruding from the calyx, reticulately rugose, not or hardly constricted between the joints, sparsely or more densely short hairy or puberulous, the hairs often hooked, glabrescent. Stems hairy and with hooked hairs often glabrous apically. Stipules ½—2 cm. Petioles 2—12 mm. Leaflet 1, broadly elliptic to narrow-lanceolate, ½—8½ by ½—3 cm, glabrous above, pubescent beneath, especially on the nerves and along the margin. . . . . *1. A. vaginalis*

1. ALYSICARPUS VAGINALIS (L.) DC.

Alysicarpus vaginalis (L.) DC., Prod. 2: 353. 1825; W. & A., Prod. 233. 1834; Miq., Fl. Ind. Bat. 1, 1: 231. 1855; Benth., Fl. Austr. 239. 1864; Oliv., Fl. Tr. Afr. 2: 170. 1871; Hook., Fl. Br. Ind. 2: 158. 1879; Merr., En. Philip. 2: 292. 1923; Craib, Fl. Siam. En. 1: 432. 1931; Back., Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 90. 1941; Léonard *in* Bull. Jard. Bot. Brux. 24: 84. 1954; Fl. Cong. Belg. 5: 224. 1954. — *Genista articulata etc.* Burm., Thes. Zeyl. 104, *t. 49 f. 1.* 1738. — *Hedysarum vaginale* Linné, Sp. Pl. 746. 1753; Willd., Sp. Pl. 3, 2: 1176. 1803; Roth, Nov. Sp. Pl. 354. 1821; Roxb., Fl. Ind. 3: 345. 1832. — *Hedysarum nummularifolium* (*non* L.) Willd., Sp. Pl. 3, 2: 1173. 1803. — *Hedysarum bupleurifolium* (*non* L.) Willd., Sp. Pl. 3, 2: 1171. 1803. — *A. nummularifolius* (*non Hedysarum nummularifolium* L.) DC., Prod. 2: 353. 1825; W. & A., Prod. 232. 1834; Merr., En. Philip. 2: 292. 1923. — *Hedysarum ovalifolium* Schum., Beskr. Guin. Pl. 359. 1827, *non vidi.* — *A. scaber* Spanoghe *in* Linnaea 15: 194. 1841. — *A. vaginalis β nummularifolius* (*non* L.) Miq., Fl. Ind. Bat. 1, 1: 232. 1855; Hook., Fl. Br. Ind. 2: 158. 1879. — *A. ovalifolius* Léonard *in* Bull. Jard. Bot. Brux. 21: 88. 1954; Fl. Cong. Belge 5: 226. 1954.

DISTRIBUTION. — Tropics of the Old World, throughout Malaysia, introduced in tropical America. Along road-sides, in grassfields, dunes, and in cultivated grounds, preferring rather dry soil but rather indifferent to climatic conditions though on the whole obviously preferring places subject to at least a short annual dry spell; up to 1225 m altitude.

NOTES. — Although Wight & Arnott (Prod. 233. 1834) clearly demonstrated that, though *Hedysarum nummularifolium* L. was taken up by

Willdenow in consequence of Linné's reference to Petiver, the plant of Flora Zeylanica, and in Hermann's herbarium, is *Indigofera echinata*, they used the name *A. nummularifolius* DC. alongside that of *A. vaginalis*.

It may be remarked in passing that Petiver's plant is, according to Schindler (*in* Fedde, Rep. 23: 103. 1927), *Alysicarpus monilifer* (L.) DC.

Wight & Arnott indicated some differences between these two alleged species, *viz* in the length of the stipules and the indument of the pod. From the abundant material I could study and which is very uniform I conclude that the stipules are variable in length in proportion to the length of the petiole. I never found a fully glabrous pod.

Léonard created a new species, *A. ovalifolius*, which would be an annual with lax racemes, in contrast with *A. vaginalis* which has dense racemes and is perennial with often creeping rooting stems. To measure the density of the racemes he took as ratio the distance between the pedicels compared with the length of the flowers: "entrenoeuds ordinairement plus courts que les fleurs" in *A. vaginalis* and "entrenoeuds plus longs que les fleurs" in *A. ovalifolius*. In the material I have seen this ratio is rather constant and the internodes are generally slightly longer than the flowers. In the specimen Léonard cited from Malaysia (Sumatra, Tapanuli, Junghuhn) to belong to *A. ovalifolius* the flowers exceed the internodes; therefore I find no reason to recognize it as a different species; it may be an African race.

2. Alysicarpus bupleurifolius (L.) DC.

Alysicarpus bupleurifolius (L.) DC. Prod. 2: 352. 1825; W. & A., Prod. 233. 1834; Miq., Fl. Ind. Bat. 1, 1: 232. 1855; Hook., Fl. Br. Ind. 2: 158. 1879; Merr., En. Philip. 2: 292. 1923; Craib, Fl. Siam. En. 1: 432. 1931; Back., Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 90. 1941. — *Hedysarum bupleurifolium* Linné, Sp. Pl. 745. 1753; Roxb., Fl. Ind. 3: 346. 1832.—*Hedysarum gramineum* Retz., Observ. 5: 26. 1789; Willd., Sp. Pl. 3, 2: 1172. 1803; Roxb., Fl. Ind. 3: 346. 1832.

Distribution. — Mauritius, Bourbon, India to southern China; Malaysia: Philippines, Celebes, Moluccas, Java, Lesser Sunda Islands; N. Australia, and Polynesia. Along road-sides, in grassfields, and in cultivated grounds; often on heavy soils, in sunny places subject to a pronounced dry season; up to 950 m altitude.

3. Alysicarpus rugosus (Willd.) DC.

Alysicarpus rugosus (Willd.) DC., Prod. 2: 353. 1825; Miq., Fl. Ind. Bat. 1, 1: 233. 1855; Benth., Fl. Austr. 2: 239. 1864; Oliv., Fl. Trop. Afr. 2: 170. 1871; Hook., Fl. Ind. 2: 159. 1879; Sedgwick *in* J. Ind. Bot. Soc. 1: 18. 1919; Back., Bekn. Fl. Java (em. ed.)

5: fam. 120, p. 91. 1941; Léonard *in* Bull. Jard. Bot. Brux. 24: 92. 1954; Fl. Cong. Belge, 5: 229. 1954. — *Hedysarum rugosum* Willd., Sp. Pl. 3, 2: 1172. 1803. — *A. wallichii* W. & A., Prod. 234. 1834; Craib, Fl. Siam. En. 1: 432. 1931. — *A. longifolius* (*non* W. & A.) Spanoghe *in* Linnaea 15: 194. 1841 (no description). — *A. violaceus* (*non Hedysarum violaceum sensu* Forsk.) Schindl. *in* Fedde, Rep. 21: 13. 1925.

DISTRIBUTION. — From Africa to India; Malaysia: Java, Lesser Sunda Islands (Bali), and Australia (Queensland). Along road-sides, in grass-fields, and as an undershrub, in sunny places, bound to areas subject to a severe dry season; up to 1200 m altitude.

NOTE. — Schindler called this species *A. violaceus*, based on *Hedysarum violaceum (non* L.) Forsk., Linné's plant being *Lespedeza violacea* (L.) Pers. According to Léonard Forskall's plant is not *rugosus* but another species: *A. glumaceus* DC.

4. ALYSICARPUS TIMORENSIS Spanoghe

Alysicarpus timorensis Spanoghe *in* Linnaea 15: 194. 1841. — *A. styracifolius* (*non* DC.) Miq., Fl. Ind. Bat. 1, 1: 235. 1855.

DISTRIBUTION. — Endemic in Timor.

CHRISTIA Moench

The use of another generic name is required for what was *Lourea* Neck. since the generic names of Necker are no longer recognized, and because of the fact that after Necker the name *Lourea* was first used by St. Hilaire (*in* Nouv. Bull. Soc. Philom. Paris 3: 193. 1812) which has been proposed to reject in favour of *Moghania* St. Hil. Anyhow *Lourea* Desv. (*in* Journ. de Bot. 1: 122. 1813) is a later homonym and cannot be used freely under the circumstances.

Dr. Bakhuizen van den Brink, who brought this to my knowledge, indicated that what is currently known as *Lourea* should be placed under the generic name *Christia* Moench (Suppl. Meth. Pl. 39. 1802), the first synonym of *Lourea* Necker.

The genus is not a very large one and is distributed in tropical SE. Asia, Malaysia, and Australia, one species being pantropic through introduction.

Among the Malaysian species there are two well-known ones, *viz obcordata* and *vespertilionis*, and two others which are only known from a single collection. All are bound to a seasonal climate. Of *C. vespertilionis* it has been suggested that it is not native in Malaysia, and in fact it is cultivated in botanical gardens as an ornamental and has even been cul-

tivated for its remarkable leaves in Europe. It is, however, not very likely that in Malaysia it has escaped from cultivation, as it was already collected in Java by Horsfield, when there were no botanical gardens in the East. It has also been found in Ternate, far from botanical Gardens, and has been recorded from early collections in Timor, from where I have not seen, however, actual sheets.

The two endemic species are more or less doubtful with regard to their specific distinction; both were collected by Zollinger, one in West Java, the other in Lombok. This will be further discussed under the account of the species.

KEY TO THE SPECIES

1. Pod exserted from the calyx. Leaflet 1, broad-elliptic, or the greatest width somewhat below the middle, slightly emarginate at both ends, 1½—3 by 1½—2½ cm. Calyx in anthesis 2 mm long or less, in fruit ± 3 mm long; lobes rather narrow-triangular, separated by wide angles, as long as the tube . . . . . *3. C. parviflora*
1: Pod not exserted. Leaflets 1—3.
2. Terminal leaflet distinctly papilionaceous, more than 3 times as wide as long, ½—2½ by 2—8½ cm, lateral leaflets (if present) obdeltoid or broadly elliptic, often asymmetrical and emarginate, ½—1½ by ½—2 cm. Calyx during anthesis c. 4 mm long, accrescent to c. 8—10 mm, then much longer than the rather stout pedicel; lobes as long as the tube . . . . . *1. C. vespertilionis*
2. Terminal leaflet not papilionaceous, but obdeltoid or broad-elliptic, often emarginate, less than 3 times as wide as long, ½—3 by 1—3½ cm. Pedicels of the fruit calyx slender and about as long as the calyx.
3. Calyx during anthesis c. 4 mm long, accrescent to c. 11 mm, the lobes twice as long as the tube, the margin of the tube just below the angles between the lobes with 5 ± horn-like inflations . . . . . *4. C. zollingeri*
3. Calyx during anthesis c. 2 mm long, accrescent to c. 4—7 mm, the lobes about as long as the tube, margin of the fruit calyx hardly protruding below the angles between the lobes . . . . . *2. C. obcordata*

1. **Christia vespertilionis** (L. f.) Bakh. f., *comb. nov.*

Hedysarum vespertilionis L.f., Suppl. 331. 1781; Lour., Fl. Coch. 447. 1790; Willd. Sp. Pl. 3: 2. 1171. 1803; Roxb., Fl. Ind. 3: 352. 1832. — *C. lunata* Moench, Suppl. Meth. Pl. 39. 1802. — *Lourea vespertilionis* Desv. *in* Journ. de Bot. 1: 122, *t. 5 f. 18.* 1813; DC., Prod. 2: 323. 1825; W. & A., Prodr. 221. 1834; Decne, Herb. Tim. Descr. 144. 1835; Wight, Ic. *t. 285.* 1840; Miq., Fl. Ind. Bat. 1, 1: 264. 1855; Baker, Fl. Br. Ind. 2: 154. 1879; Gagnep., Fl. Gen. I.-C. 2: 533. 1920; Merr., En. Philip. 2: 293. 1923; Craib, Fl. Siam. En. 1: 430. 1931; Back., Onkr. Suiker. 348. 1930; Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 94. 1941.

DISTRIBUTION. — Somestimes held a native of Siam, but probably also native in Burma and Indo-China, and even in Malaysia; in the Leyden

collections represented from extreme East Java, the Moluccas (Ternate), and recorded from the Lesser Sunda Islands (Timor); fl. March - Sept., in the seasonally dry lowlands, between 15 and 350 m altitude.

As has been alluded to in the introduction the earliest collections in Malaysia suggest that it is native though rare. There is one collection by Norris from Malaya, but this was later and may have been derived from specimens cultivated in Penang, where Norris was a resident.

2. **Christia obcordata** (Poir.) Bakh. f., *comb. nov.*

Hedysarum reniforme (*non* L.) Lour. Fl. Coch. 447. 1790. — *Hedysarum obcordatum* Poir. *in* Lamk Encycl. 6: 425. 1804, *non vidi*. — *Lourea obcordata* Desv. *in* Journ. de Bot. 1: 122. 1813, *non vidi*; DC., Prod. 2: 324. 1825; Decne, Herb. Tim. Descr. 143. 1835; Spanoghe *in* Linnaea 15: 193. 1841; Miq., Fl. Ind. Bat. 1, 1: 265. 1855; Baker, Fl. Br. Ind. 2: 154. 1879; Gagnep., Fl. Gén. I.-C. 2: 536. 1920, incl. *var. reniformis* ("Lour."), *nom. illeg.*; Merr., En. Philip. 2: 293. 1923; Craib, En. Fl. Siam. 1: 429. 1931; Merr. in Trans. Am. Phil. Soc. 24, 2: 204. 1935; Back., Onkr. Suiker, 347. 1930; Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 94. 1941. — *Lourea reniformis* [(*non Hedysarum reniforme* L.), sens. Lour. excl. syn.] DC., Prod. 2: 324. 1825, *nom. illeg.*; Merr. *in* Philip. J. Sc. 5: Bot. 354. 1910; Schindl. *in* Feddè, Rep. Beih. 49: 5. 1928.

DISTRIBUTION. — Widely distributed in tropical SE. Asia from India to S. China and Formosa, to Malaysia in NE. Sumatra (Padang Lawas), Java (common in E. Java and Madura, but rare in W. Java: Djakarta, Tjikepuh, Pasauran), the Lesser Sunda Islands (Bali, Lombok, Timor, Leti), the Philippines (N. Luzon, Mindanao), SW. Celebes, Moluccas (W. Ceram), and E. New Guinea (Wau, Cape Vogel, Pt Moresby).

It occurs in dry grasslands and sunny places, along roadsides, etc.; fl. March - Sept., from the lowland up to 1050 m altitude. In many places specimens are dwarfed and the stembase or the apex of the taproot are often thickened and woody by annual burning; charred stembases occur on the sheets.

NOTES. — The terminal leaflet is almost always widest above the middle, but if there is only one leaflet it is often broad-elliptic with sometimes the greatest width below the middle.

See further the notes under *C. parviflora* and *C. zollingeri*.

As Merrill has shown, the combination *Hedysarum reniforme* Lour., which has been used as a basonym onwards of De Candolle (1825) and recently by Schindler and Domin, was not a new species proposed by Loureiro; he quoted it from Burman, Fl. Ind. 164, t. 52 f. 1. 1768, and Burman quoted it in his turn from Linnaeus. Linnaeus described a plant as *Hedysarum renifolium* L., Syst. Nat. ed. 10, 2: 1169. 1759, which he later

referred to as *Hedysarum reniforme* L., Sp. Pl. ed. 2: 1051. 1763. As Schindler has shown (*in* Fedde, Rep. 22: 262. 1922) this refers to one species and is really a *Desmodium*. Loureiro misinterpreted it and used its name for Indo-Chinese material which is, however, *Lourea obcordata*. In *Lourea* the epithet *reniformis* is illegitimate and can also not been used for a variety as done by Gagnepain (Fl. Gén. I. - C.).

3. **Christia parviflora** (Schindl.) Bakh. f., *comb. nov.*

Lourea parviflora Schindl. *in* Fedde, Rep. 21: 19. 1925.

DISTRIBUTION. — Lesser Sunda Islands (Lombok), once collected by Zollinger n. 3214 (in G, BRSL).

NOTES. — I have seen material of this species and the following one, kindly sent on loan by the courtesy of the director of the Herbarium at Geneva. The specimens appear to be close to those of *Lourea obcordata*, except in the leaf-shape and in the calyx which is hardly accrescent which explains the exserted pod. My impression is, however, that the specimens are not quite „normal"; they are full of flagellate, bare, thin rachises of racemes which obviously date back from a previous flowering period. The present anthesis may represent, therefore, a second poorly developed flowering period. This might explain abnormalities in the accrescence of the calyx. It may also explain the fact that only unifoliolate leaves are present. When more material will be available it may appear that it is not a good species.

4. **Christia zollingeri** (Schindl.) Bakh. f., *comb. nov.*

Lourea zollingeri Schindl. *in* Fedde, Rep. 21: 20. 1925.

DISTRIBUTION. — West Java, pr. Tjikoja, once collected by Zollinger n. 1066 (B, ?†; G).

NOTES. — It is rather strange that Schindler described the calyx as having very short lobes (1½—2 mm); in the Geneva specimen the lobes are twice as long as the tube and measure 7—8 mm.

In the leaf this species does not appear to show much difference from some specimens of *C. obcordata*, but the calyx is much larger accrescent and shows 5 horn-like protuberances due to the high degree of inflation of the calyx. It seems strange that no other specimens would have been found in Java and it may ultimately appear to be an aberrant form of *C. obcordata*.

Christia obcordata has been recorded from North Australia by Bentham, Fl. Austr. 2: 238. 1864 (Upper Victoria R., F.v. Mueller), but I agree with Schindler that his description of the Australian plant differs in several points from that of *C. obcordata, viz* in the articulations of the pod, the shape of the pod-joints, and the length of the calyx. Domin distinguished the N. Australian plant as *Lourea obcordata* var. *reticulata (in* Fedde, Rep. 11: 263. 1912), later as *Lourea reniformis* var. *reticulata* (Domin) Domin (*in* Bibl. Bot. Heft 89: 770. 1926). Schindler based a new species on it, *Lourea australasica* Schindl. *in* Fedde, Rep. 22: 254. 1926. It should be known in future as **Christia australasica** (Schindl.) Bakh. f., *comb. nov.*

NOTES ON DESMODIUM Desv.

1. THE VARIABILITY AND SYNONYMY OF DESMODIUM HETEROCARPON (L.) DC.

The detailed examination of this very common species yielded as a result that two distinct forms can be distinguished.

In consulting the literature it appeared that most authors have accepted it in the wide sense, incorporating in it what has been described under the names *D. polycarpum* (Poir.) DC. and *D. ovalifolium* Wall., for example Wight & Arnott, Prod., Baker in Fl. Br. Ind., and Backer in his various works.

De Candolle, and recently Schindler, on the other hand, kept the three apart.

The two forms, here distinguished as varieties, are sharply separated mainly on the character of the indument of the rachis and the pods, as follows:

(1) Rachis hooked-hairy. Pods hooked-hairy, on both margins and surfaces. Leaflets 1—3.

(2) Rachis strigose, similarly as the stem. Margins of the pods fringed with hooked hairs, hardly so on the surfaces. Leaflets 3.

The type *Hedysarum heterocarpon* L. 1753, referred to in his Fl. Zeyl., is represented by Ceylon specimens collected by Hermann. The three specimens of Hermann at the British Museum were kindly examined by Dr. W. T. Stearn and agree with the first form here distinguished which, therefore, must be the type variety of *D. heterocarpon* (L.) DC.

The epithet *heterocarpon* was chosen as the early authors were impressed by the fact that the lowermost pods may be 1-seeded, as clearly portrayed in Burman, Thes. Zeyl. t. 53, f. 1. This is, however, not a con-

sistent character and the Hermann material does not manifest the heterocarpy thus stressed; most material I have examined in the Rijksherbarium collections does neither. It is obviously a potential characteristic (of ?insufficient pollination) not always realized.

Besides, De Candolle recognized a second species, *D. trichocaulon* DC. This I have reduced to the first form, although Baker held it up as a variety under *D. polycarpum*.

The second form was described first by Burman f. in 1768 as *Hedysarum siliquosum*, later transferred by De Candolle to *Desmodium* as *D. siliquosum*. Accepting Schindler's identifications of the types it seems to be the same as *Hedysarum polycarpum* Poir. in Lamk. The latter was also recognized by De Candolle as a separate species *D. polycarpum* (Poir. in Lamk) DC.

In addition to the four names mentioned above Wallich distinguished, in India, a fifth species which he named in his Numerical List no. 5730 *D. ovalifolium*. This has been held up by various authors, but Prain already reduced it as a variety to *D. polycarpum*. I have seen several sheets attributed to it; its pods are generally rather densely, shaggy, yellowish hooked-hairy and the apical leaves bear almost invariably only 1 leaflet. Also, the hooked hairs on the pod are short to rather longish on each pod, whereas those of the first form are mostly rather uniformly shortish. It is, however, not sharply demarcated and I have reduced it.

The distinction of the two forms as varieties is justified by the fact that although their areas entirely overlap, each separate collection consists either of the one or the other, which means that they do not grow together in exactly the same spot; there are no intermediates. In only two sheets out of several hundreds I examined they occurred mixed, but were obviously not gathered in the same place. Backer (1930) mentioned their differential character but considered it just a variation not worthy of distinction.

There is one sheet which clearly deviates; is was collected by Hoogland & Pullen 6233 in New Guinea. Instead of being appressed-hairy, the stem and leaves of this sheet are covered by a dense, white, soft-velutinous indument. As it does not bear fruit, I have left it unnamed although it seems clearly to belong to *D. heterocarpon sensu lato*.

In one instance, one stem of a collection possessed an intermediate indument, *viz* of Aet & Idjan 854.

The synonymy and distribution of the two varieties run as follows:

DESMODIUM HETEROCARPON (L.) DC.

Desmodium heterocarpon (L.) DC., Prod. 2: 337. 1825, *sensu lato;* Merr., En. Philip. 2: 285. 1923; Backer & van Slooten, Handb. Thee. 141, *t. 141.* 1924; Backer, Onkruidfl. Suiker. 335. 1930; Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 85. 1941. — *Hedysarum heterocarpon* L., Sp. Pl. 747. 1753. — *D. polycarpum* (Poir.) DC., Prod. 2: 334. 1825, *sensu lato;* W. & A., Prod. 227. 1834, *excl. syn. D. capitatum;* Miq., Fl. Ind. Bat. 1, 1: 242. 1855; Bth., Fl. Austr. 2: 235. 1864; Oliver, Fl. Trop. Afr. 2: 165. 1871; Baker in Fl. Br. Ind. 2: 171. 1879; Backer, Schoolfl. Java 343. 1911, *excl. syn.*

VAR. HETEROCARPON

var. *heterocarpon.* — *Hedysarum heterocarpon* L., Sp. Pl. 747. 1753. — *D. heterocarpon* DC., Prod. 2: 335. 1825, *sensu str.;* Gagnep., Fl. Gén. I.-C. 2: 588. 1922; Schindl. *in* Fedde, Rep. Beih. 49: 278. 1928; Craib, Fl. Siam. En. 1: 408. 1931; Hosokawa *in* J. Soc. Trop. Agric. 4, 2: 201. 1932, as var. *buergeri* (Miq.) Hosokawa. — *D. trichocaulon* DC., Prod. 2: 335. 1825. — *D. ovalifolium* Wall., Cat. 5730, *nomen;* Gagnep., Fl. Gén. I.-C. 2: 587. 1922; Merr., En. Philip. 2: 287. 1923; Schindl. *in* Fedde, Rep. Beih. 49: 287. 1928; Craib, Fl. Siam. En. 1: 414. 1931. — *D. buergeri* Miq. *in* Ann. Mus. Bot. Lugd. Bat. 3: 45. 1867; Merr. *in* Philip. J. Sc. 5: 85. 1910; En. Philip. 2: 284. 1923. — *D. polycarpum var. trichocaulon* (DC.) Baker *in* Fl. Br. Ind. 2: 172. 1879, *excl.* Wall., Cat. 5729 B, D, F. — *D. polycarpum var. ovalifolium* Prain *in* J. As. Soc. Beng. 66, ii: 141. 1897.

Rachis hooked-hairy; stems strigose. Pods hooked-hairy, on both margins and surfaces. Leaflets 1—3.

DISTRIBUTION. — E. Asia (Japan, China, Formosa), SE. Asia (India to Indo-China), and throughout Malaysia.

SPECIMENS EXAMINED. — *Arañez 4; Bakhuizen van den Brink 124, 887, 1409; Bakhuizen van den Brink f. 810, 1266; Bloembergen 3331; Carr 14677; Coert 307; Corner & Nauen S.F. 38112; Darnton 70, 80; Dorgelo B 147; Elbert 965, 1435, 4385, 4431, 4534, 4574, 4578; Moh. Enoh 56; Farinas P. N. H. 20428; Forbes 4102; Garrett 1468; Hallier 4082; Hassan & Kadim H. 3; Henderson & Nauen S. F. 38116; Holstvoogd 200a, 369a, 459; Hoogland & Pullen 6233; Jaag 324; Lam 2600; Lörzing 6062, 6462; Monod de Froideville 39, 342, 487, 648, 669; Odashima 17870; Oldham K.D. 353; van Ooststroom 13139, 13989; Purseglove & Shah P 4370, P 4372; Raap 187; van Royen 4247; Schiffner 2051; Sinclair & Kiah bin Salleh S. F. 40506; Socwarta 52; van Steenis 7959, 7998; Tsui 711; Ungar N. G. F. 9539; de Voogd 152, 1117; Hub. Winker 2945; Wallich 5730; Zollinger 150, 349 (?319).*

VAR. STRIGOSUM VAN MEEUWEN, *var. nov.*

Hedysarum siliquosum Burm. f., Fl. Ind. 169, *t. 55 f. 2.* 1768. — *Hedysarum polycarpum* Poir. *in* Lamk, Encycl. 6: 413. 1805. — *D. polycarpum* DC., Prod. 2: 335. 1825, *pro typ. et partim;* Gagnep., Fl. Gén. I.-C. 2: 586. 1922. — *D. siliquosum* DC., Prod. 2: 336. 1825; Schindl. *in* Fedde, Rep. Beih. 49: 298. 1928; Craib, Fl. Siam. En. 1: 418. 1931.

Rachis strigosa.

TYPE. — *Kalkman B.W. 3596* (New Guinea) in L; isotypes in A, BO CANB, P.

DISTRIBUTION. — SE. Asia and throughout Malaysia, New Caledonia.

SPECIMENS EXAMINED. — *Aet & Idjan 57, 582, 854; Anang 205; Asdat 14 Atasrip 639; Backer 26421, 32041, 32044; Bloembergen 3611, 4452; Blume 976; Boe lage 118, 252; van Borssum Waalkes 1966, 3202; Brass 5705, 7535, 8345, 11710, 2596 27225; Brooke 8264; Bünnemeijer 3553, 4009, 7701; Buwalda 4019, 7879, 7926; Carol & Ch. Frake P. N. H. 36012; Carr 11409; Cuming 845; Curran F. B. 19103; Docter van Leeuwen 3236; Dorgelo 115; Elbert 4469, 4546, 4576; Elmer 11093, 13994, 1716 Endert 1796; Eyma 3323; Frohne P. N. H. 35724; Garrett 1352; Halli 553; Helfer 94, K. D. 1629; Hohenacker 239; Hosseus 128; Iboet 221; Idja & Mochtar 115; Junghuhn 178; Kalkman B. W. 3596; Kievits 2692; King's coll. 142 Koch 629; Kochumen KEP 71970; Kornassi 1072; Korthals 56; Krukoff 4013; La 2098, 2487, 3070; Lau 20299; Lauterbach 1436; van Leeuwen Poe 2; Lörzing 662 Main 2010; Mendoza P. N. H. 18466; Merrill 5221; Mondi 281; Monod de Froidevil 34, 330, 331, 332, 333, 431, 486, 647; Mooney 4008; Nedi & Idjan 469; Neth. Ind. For Service 60; Posthumus 472, 580; Purseglove P5496; Rahmat si Boeea 5845, 623 9173, 9933; Ramos B. S. 21747, B. S. 44232; Ramos & Pascasio B. S. 34960; Reinward 1638; Robinson 2014; van Royen 4066; Sinclair & Kiah bin Salleh S. F. 40440; va Slooten 799; van Steenis 1146; Surbeck 60; Tanaka & Shimada 17832; Versteeg 1947 Versteegh B. W. 7421; Vieillard 365; de Voogd 67, 1266; Weinland 159; Wight K. D. 716; Winkler 2151; van Wijk 68; Zollinger 210.*

2. DISCRIMINATION OF DESMODIUM ORMOCARPOIDES DC. AND D. ZONATUM MIQ.

Among the unifoliolate *Desmodiums* of Malaysia these two species have been confused in the past by several authors and seem not to be well separated and labelled in herbaria, although Gagnepain has very clearly exposed the differences between these two species and the history of the name giving (Not. Syst. 3: 255. 1916); he also provided for new Latin descriptions.

Desmodium ormocarpoides was a new name, and a new combination, given by De Candolle (Prod. 2: 327. 1825) to accommodate a species described by Poiret under the name *Hedysarum adhaerens* Poir. in Lamk. Encyclop. Suppl. 5: 15. 1817, which combination was pre-occupied by *Hedysarum adhaerens* Vahl, Symb. Bot. 2: 82. 1791, from the West Indies.

Poiret's specimen was said to have been collected by Labillardière in Java.

De Candolle took the epithet from a specimen named by Desvaux in the herb. Desfontaines. This was said to have also been collected in Java. It has been examined by Gagnepain and found conspecific with other specimens collected in the Moluccas: Buru, by Labillardière and by Lahaie and some from Celebes by Koorders.

These early Java records must have been based on erroneously localized specimens, as *D. ormocarpoides* does not occur in Java! They may have come from Buru.

Zollinger used the name *D. ormocarpoides* DC. for a specimen collected by him in West Java, pr. Tjikoja (Nat. Geneesk. Arch. 3: 58. 1846), his field number being 1060. In summing up his Flora Indiae Batavae Miquel found this an erroneous identification and based a new species on it, *D. zonatum* Miq. This later proved to be widely distributed mainly in SE. Asia and Malaysia. Unfortunately Baker continued Zollinger's misidentification in the Flora of British India and he was followed by many later authors, so that the epithet *ormocarpoides* is found in many SE. Asiatic Floras. All these specimens should, however, be referred to *D. zonatum* Miq. as *D. ormocarpoides* DC. is confined to Central and East Malaysia.

For taxonomically obscure reasons Schindler found fit to accommodate *D. ormocarpoides* into a monotypic genus of its own, *Hanslia*, using as its specific epithet the nomenclaturally inadmissable epithet *adhaerens* (in Fedde, Rep. 20: 277. 1924).

The essential synonymy and distribution of both species are cited here:

1. DESMODIUM ZONATUM MIQ.

Desmodium zonatum Miq. Fl. Ind. Bat. 1, 1: 250. 1855; Pulle, Nova Guinea 8: 651. 1912; Gagnep. Not. Syst. 3: 257. 1916; Merr. En. Philip. 2: 290. 1923. — *D. ormocarpoides* (*non* DC.) Zoll., Kurz, Baker, *auct. plur.*

Stipules rather wide triangular, straw-coloured, lengthwise prominent-veined. Leaflet underneath pale green with distinct appressed white hairs. Pod joints less than twice as wide as the articulations, the joints with lengthwise prominent veins.

DISTRIBUTION AND SPECIMENS EXAMINED. — Ceylon, India, Burma, Indo-China (Tonkin, Annam, Laos, Cochinchina), and Malaysia: Sumatra (*Bünnemeijer 3835, Rahmat si Toroes 5566, Bartlett & La Rue 145, Meijer 3117, Raap 405* (Batu Is.), *Forbes 2023a, Lütjeharms 5318* (Enggano I.), *Rahmat si Boeea 8499)*; Borneo (*Hub. Winkler 2755*); Java (*De Monchy s.n., Holstvoogd 308, Popta 710/158, Backer 7271, 36346, 36973, Brinkman 864a, Dorgelo 1755, Coert 713, Schiffner 2044, 2054, 2055, 2058)*; Lesser Sunda Islands: Lombok (*Elbert 680, 843, 2501*); Celebes (*Kaudern 367, Monod de Froideville 23*); Philippines (*B.S. 33876, 37365, 41500, PNH 1937, 11117, Elmer 10134, 11064, 14444, 18191, Cuming 437, 681)*; Moluccas: Key Is. (*Jaheri s.n.*), Tanimbar Is. (*van Borssum Waalkes 3148*); New Guinea (*Carr 11479, 16355, Brass 25882, Gjellerup 39,*

Weinland 214, Forbes 946, Feuilletau de Bruyn 171, Docters van Leeuwen 10584, van Royen 4976, 4831, Janowski 550, Pullen NGF 1190); Solomon Islands: Florida I. (*Kajewski s.n., Brass 3516*).

2. Desmodium ormocarpoides DC.

Desmodium ormocarpoides DC. Prod. 2: 327. 1825; Gagnep., Not. Syst. 3: 250. 1916; Merr. En. Philip. 2: 287. 1923. — *Hedysarum adhaerens* Poir. *in* Lamk, Encyclop. Suppl. 5: 15. 1817, *non* Vahl. 1791. — *D. dependens* Bl. *ex* Miq. Fl. Ind. Bat. 1, 1: 248. 1855. — ? *D. pendulum* Teysm. *ex* F.v.M. *in* Campbell, A Year in the New Hebrides 9. 1873, *p.p.*; *cf.* F.v.M. Descr. Not. Pap. Pl. 1: 7. 1875. — *Hanslia adhaerens* Schindl. *in* Fedde, Rep. 20: 276. 1924; Guillaumin *in* J. Arn. Arb. 12: 244. 1931.

Stipules very narrow acuminate-triangular from a wide base, not distinctly parallel-veined, not straw-coloured. Leaflets glabrous underneath brownish in the herbarium. Pod joints many times wider than the articulations, joints not with distinctly elevated lengthwise veins.

Distribution and Specimens Examined. — Lesser Sunda Islands: Timor (*van Steenis 18165*); Celebes (*Reinwardt 1512, Elbert 3231, 3387, Kaudern 107, 368, Koorders 17612, 17617, 17618, 17619*); Moluccas: Batjan (*Nedi (exp. de Haan) 78, 134, 151*), Ceram (*Buwalda 5878, Rutten 1653*), Halmahera (*Beguin 2339*), Buru (*Toxopeus 619*), Key Is. (*Jaheri s.n.*), Banda (*Anon.*), Ambon (*Robinson 555, 556*), Ternate (*De Vriese & Teysmann s.n.*); New Guinea (*Hoogland 4556, H.J. Lam 7715, Floyd & Hoogland 3832, Kalkman 3419, van Royen 3251, 3272, 4274, Janowski 515, Brass 8362, Aet 315, Carr 11637, 11673, 16300*); according to Guillaumin also in the Bismarcks, Solomons, and New Hebrides (Aneytum, Tanna, Efate, Eromanga, Anatom, and Vanua Lava); it was also reported from Australia and New Caledonia, but possibly erroneously.

3. Desmodium sequax Wall. and D. megaphyllum Zoll.

The reason for drawing up this note is that I found confusion in the naming of the specimens of these two species.

Several specimens of *Desmodium megaphyllum* had by error been identified with *D. timoriense* DC. — which is a synonym of *Pseudarthria viscida* (L.) W. & A. — and can easily be distinguished by the flat, rather broad, entire (or nearly so), not jointed pod (Backer, Schoolfl. Java 345. 1911). Some of these specimens had later been renamed *D. sequax* Wall. but belong clearly to *D. megaphyllum* Zoll.

The confusion is probably due to the fact that the specimen depicted by Wallich has entire, elliptic-oblong, acute, slightly acuminate large

leaves which differ in aspect distinctly from those of typical *D. sinuatum* Bl. or *D. dasylobum* Miq., although the flowers and pods show no differences. This is probably the reason why in the Fl. Br. Ind. *D. sequax* and *D. dasylobum* were kept (rather widely) apart.

Prain has later pointed out that there are two "forms" of *D. sequax* corresponding to the just-mentioned species. He kept them apart as species, though stating that the difference in calyx structure, ascribed to them in the Fl. Br. Ind., is non-existent (*in* J. As. Soc. Beng. 66, ii: 394. 1897). The leaves of Wallich's form resemble those of *D. megaphyllum*, which, as will be shown below, is an entirely different species.

The existence of these two „forms" has probably also been decisive for Backer to keep the safe name *D. dasylobum* for the Javanese plants instead of accepting *D. sequax* which is the oldest name (Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 83. 1941).

Merrill also accepted the name *D. dasylobum* in his Enumeration of Philippine flowering Plants (p. 284. 1923), but later reduced it to *D. sequax* (*in* Contr. Arn. Arb. 8: 76. 1934), following Schindler (*in* Fedde, Rep. Beih. 19: 272. 1928).

In going through a large quantity of material it has appeared that in the northern part of the area specimens transitional between the two "forms" have been found as to degree of lobation of the leaf margin and the apex of the leaflets (blunt or acute), e.g. PNH 15017 from the Philippines has almost entire leaves. In Formosa Gressitt 406 and Tanaka 352 have lobed leaflets which are acute, but Tanaka & Shimada 13435 has almost entire leaves which are blunt. From India a Hooker specimen has acute leaves which are slightly lobed; Masters s.n. from Assam has lobed leaves which are acute.

From the occurrence of these transitional specimens I conclude that Schindler and Merrill were correct in their reduction and that only one species is concerned.

KEY TO THE SPECIES

1. Leaflets ovate, rhomboid, more or less undulate or coarsely crenate to sublobate along the margin, obtuse, more rarely acute to acuminate. Stipules small, c. 1 mm wide, spathulate, caducous, leaving a small scar. Pod moniliform, densely covered with densely set, brown, hooked hairs. Joints c. 4 by 3 mm. Peduncle with straight hairs . . . . . *D. sequax*

1. Leaflets ovate-acuminate. Stipules c. 3—4 mm wide, broad-triangular, caducous, leaving a broad scar. Pod with hooked hairs, sometimes mixed with some straight hairs, glabrescent with maturity (or glabrous in var. *glabrescens*). Joints c. 6—7 by 5—5½ mm (or 8—10 by 8 mm in var. *glabrescens*). Peduncle with hooked hairs, glabrescent . . . . . *D. megaphyllum*

DESMODIUM SEQUAX Wall.

Desmodium sequax Wall., Pl. As. Rar. 2: 46, *t. 157.* 1831; Hook., Fl. Br. Ind. 2: 170. 1879; Kurz *in* J. As. Soc. Beng. 45, ii: 227 & 232. 1877; Prain *in* J. As. Soc. Beng. 66, ii: 400. 1897; Schindl. *in* Fedde, Rep. Beih. 49: 272. 1928; Merr. *in* Contr. Arn. Arb. 8: 76. 1928; Hosokawa *in* J. Soc. Trop. Agric. 4: 313. 1932, incl. var. *sinuatum* (Bl. ex Hook.) Hosokawa. — *D. strangulatum* W. & A. var. *sinuatum* Miq., Fl. Ind. Bat. 1, 1: 255. 1855. — *D. dasylobum* Miq., Fl. Ind. Bat. Suppl. 305. 1861; Gagnep., Fl. Gén. I.-C. 2: 594. 1920; Merr., En. Philip. 2: 284. 1922; Back., Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 83. 1941. — *D. sinuatum* Bl. *ex* Hook., Fl. Br. Ind. 2: 166. 1879; Prain *in* J. As. Soc. Beng. 66, ii: 394. 1897.

DISTRIBUTION. — The species occurs in the Assam-Khasya region, in Formosa, and in Malaysia: Sumatra, Java, Celebes, the Philippines (Luzon, Mindanao), and New Guinea. It occurs introduced in the mountain Garden Tjibodas. Between the Asiatic and Malaysian ranges there seems to be a rather large gap difficult to explain as there seems no ecological factor responsible for it; possibly specimens have been misidentified and have escaped me.

SPECIMENS EXAMINED. — *Animal Industry Employee PNH 15017; Backer 13611, 31385; Bloembergen 4080; van Borssum Waalkes 2112; Boschproefstation b.b. 7625, b.b. 9823; Brass 11254, 11799; Bünnemeijer 1271, 9026, 11069, 11123, 11782, 12113, 12626; Carr 13918, 15607; Docters van Leeuwen 9727, 10130; Elmer 8398; Gressitt 406; Hallier 25; Hoogland 5201; Koorders 17604, 17614, 17616; McKee 1544; Mearns BS 4479; Mendoza & Convocar PNH 10695; Merrill BS 11648; Millar NGF 9973; Meijer 7399; Monod de Froideville 38; van Ooststroom 13140; Ouwehand 370; Pulle 1171, 1225; Rachmat 529; Rahmat si Boeea 10346, 10789, 10846; 11129, 11378; Ramos BS 5563; Rappard S40; Robbins 971; von Römer 165, 367, 541; Schiffner 2047; Smith NGF 1146; van Steenis 5832, 9463, 17918; Steiner PNH 22533; St. John PNH 18901; Sulit PNH 9970; Tanaka 352; Tanaka & Shimada 13435; Vanoverbergh 543; Versteeg 1480, 1907; Versteegh BW 3097; White NGF 1469; Yates 2416.*

DESMODIUM MEGAPHYLLUM Zoll.

Desmodium megaphyllum Zoll. *in* Nat. & Geneesk. Arch. Ned. Ind. 3: 58 & 77 1846; Miq., Fl. Ind. Bat. 1, 1: 245. 1855; Prain *in* J. As. Soc. Beng. 66, ii: 399. 1897; Gagnep., Fl. Gén. I.-C. 2: 592. 1920; Back., Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 82. 1941. — *D. karensium* Kurz *in* J. As. Soc. Beng. 45, ii: 228. 1877; Prain *in* J. As. Soc. Beng. 66, ii: 397. 1897. — *D. prainii* Schindl. *in* Fedde, Rep. 21: 2. 1925.

DISTRIBUTION. — This species occurs in S. China (Yunnan: Henry 11685 B, in K), Burma (Prain, *l.c.*), Malaya (Perak, once), Central Sumatra (once), and in Java.

SPECIMENS EXAMINED. — *Backer 8797, 14096, 22389, 37367; Bakhuizen van den Brink 4636; Blume 1588; Burck 359; Coert 1135; Dorgelo 3084; Henry 11685*

D. Holstvoogd 184b, 184c, 184d; Koorders 28581, 29260; Koorders & Koorders-Schumacher 43091; Kurz 1676; van Steenis 11082, 12809; Wisse 1031.

NOTES. — Prain stated that the MS names *D. rubescens* Bl. and *D. scandens* Bl. would belong to *D. sequax*. Miquel was, however, right in referring them to *D. megaphyllum*, which was also the opinion of Schindler (*in* Fedde, Rep. 21: 2. 1925).

According to the type specimen (in K) *D. karensium* Kurz from Burma (Pegu) is conspecific; the hairiness of the pod varies in Javanese specimens from almost glabrous to sparingly hairy.

Prain distinguished a var. *glabrescens* Prain, *l.c.*, which has leaflets more sparsely appressed-hairy beneath, larger glabrous pods (lids c. 8—10 by 8 mm), and completely glabrous inflorescence.

One of the allied species is *D. floribundum* (D. Don) G. Don (*D. multiflorum* DC., *D. sambuense* (D. Don) DC.), first definitely united under this name by Baker in Fl. Br. Ind.; it possesses pods which are covered by a densely appressed, strigose, brown indument and has further angular stems tomentose on the ribs.

Another allied species is *D. tiliaefolium* (D. Don) G. Don, which possesses larger pale pods with sparse, white, strigose, appressed hairs pointing downward and white-tomentose margin of the leaflet.

4. DESMODIUM SCORPIURUS (Sw.) Desv.

Desmodium scorpiurus (Sw.) Desv. *in* J. Bot. 1: 122. 1813; Merr., En. Philip. 2. 289. 1923. — *Hedysarum scorpiurus* Sw., Prod. Veg. Ind. Occ. 107. 1788.

DISTRIBUTION. — Hitherto in Malaysia only reported from the Philippines (Batan Is., Luzon, Mindoro, Balabac, Panay), but now also occurring in other places. The New Guinea localities might point to recent dispersal by aeroplanes, but the locality in Lombok cannot have been derived from that source.

Lesser Sunda Islands: Lombok, Labuan Tjarik: *Elbert 556* (L); Bajan: *Elbert 645* (L).

East New Guinea: Northern Div., W. end of Dobodura airstrip along Samboga R.: *Hoogland CANB 3799* (L); about 1 km S of Soputa village: *Hoogland 3756* (L).

5. DESMODIUM TORTUOSUM (Sw.) DC.

Desmodium tortuosum (Sw.) DC., Prod. 2: 332. 1825; Back., Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 49. 1941. — *Hedysarum tortuosum* Sw., Prod. Veg. Ind. Occ. 107. 1788.

DISTRIBUTION. — This species has over a century ago been found Java at Medina and Magelang by Waitz, Junghuhn, etc.; it could the have been introduced with fodder for horses of the army. It was also c tivated at Bogor and is found subspontaneous in the vicinity of Bogo Further it has been found near Bandung in several places, but also he were military stud-farms and the seed could have been introduced wi fodder.

Recently it has turned up in New Guinea which is worth recordin East New Guinea: Morobe Distr., in coastal secondary regrowth: *Flo NGF 5475;* Bululo R. near Wau: *C.T. White NGF 1471.* South New Guine Merauke, Jobar, in old garden land: *McKee 1766.*

PSORALEA L.

This considerable genus is widely distributed over various parts of th globe, but is most abundant in South Africa and North America. Fr Australia 12 species have been recorded.

There are surprisingly few native species in the Malaysian flora, wi certainty only 3, one of which it shares with Australia, the other 2 bei endemic in the Lesser Sunda Islands. A fourth species has been introduce

The genus is easily recognized by the occurrence of many black glan on the leaves, stems, and flowers. A few species are economic (Burki 1935).

The three species which are native in Malaysia are characteristic regions subject to a seasonal climate, those of the Lesser Sunda Islands b long to the endemic category and *P. badocana* obviously to the Australia category. The latter shows, as far as present collections go, a marked di junction between N. Luzon and Wetar-Papua.

KEY TO THE SPECIES

1. Leaves trifoliolate.
   2. Stipules ovate-acuminate, distinctly oblique and obliquely inserted, with a wi base, ± 1½ by 1½ cm. Racemes lax. Pedicels short, densely hairy. Bracts lar leafy, 7 by 5 mm. Calyx appressed-pubescent especially on the nerves. Low calyx lobe slightly longer than the upper ones. Leaflets 6—7 cm by 4—5 cm, broa elliptic, ovate, or rhomboid, entire, mucronulate, glabrous. . . *1. P. stipulac*
   2. Stipules ± 3 by 1 mm, oblong-acuminate, caducous. Flowers in dense racem Pedicels hairy. Bracts 2 by 1 mm. Calyx pubescent, lower calyx lobe 2 times long as the upper ones. Leaflets 2.5—7 cm by 1—4 cm, obovate to broad-ellipt obtuse or emarginate, entire, mucronulate, glabrous . . . . *2. P. tamboren*
1. Leaves unifoliolate.

Stipules 3—4 by 1 mm, obviously curved, narrow-triangular. Flowers in short-peduncled, contracted, dense-flowered racemes. Calyx densely hairy, lower calyx lobe 2—3 times as long as the upper ones. Leaflets 2½—7 to 1—2½ cm, ovate-lanceolate, acute, mucronulate, the edge shallowly undulate, slightly toothed, densely hairy on either side, specially beneath. . . . . *3. P. badocana*

Stipules 4—6 by 2 mm, triangular-oblong, acuminate. Racemes long-peduncled, dense-flowered. Calyx glabrous, lower calyx lobe less than 2 times as long as the upper ones. Leaflets 2.5—10 by 2.5—6 cm, broad-elliptic, ovate or obovate, mucronulate, edge toothed, glabrous, except for a few appressed hairs on the nerves beneath. . . . . *4. P. corylifolia*

1. PSORALEA STIPULACEA Decne

Psoralea stipulacea Decne *in* Nouv. Ann. Mus. Par. 3: 466. 1934 (*non vidi*); Herb. Timor. 138. 1835; *in* Delessert, Ic. Pl. 3: *t. 67*. 1837; Miq., Fl. Ind. Bat. 1, 1: 317. 1855.

DISTRIBUTION. — Malaysia: Timor.

I have seen the type of this species which served for the excellent drawing published of it. It is remarkable that it has never been collected since. As far as possible I have checked that it is not conspecific with other species described from Africa, Madagascar, the Seychelles, and Queensland.

2. PSORALEA TAMBORENSIS Miq.

Psoralea tamborensis Miq., Fl. Ind. Bat. 1, 1: 318. 1855.

DISTRIBUTION. — Endemic in South Malaysia: Lesser Sunda Islands: Sumbawa, Flores, Alor, and Timor, obviously in very dry lowland areas at c. 200 — 300 m alt. Fl. May, Aug. - Dec.

3. PSORALEA BADOCANA (Blanco) Blanco

Psoralea badocana (Blanco) Blanco, Fl. Filip. ed. 2: 416. 1845; Bth., Austr. 2: 190. Herb. Timor. 138. 1835; *in* Delessert, Ic. Pl. 3: *t. 67*. 1837; Miq., Fl. Ind. Bat. 1, 1: 597. 1837. — *Meladenia densiflora* Turcz. *in* Bull. Soc. Nat. Mosc. 21 (1): 576. 1848.

DISTRIBUTION. — N. Australia (Northern Territory and N. Queensland), S. New Guinea (Hisio), Lesser Sunda Islands (E. Timor, Wetar), and Philippines (N. Luzon), in open grasslands, waste places, and open savannah land, at low (and in the Philippines also medium) altitude.

The Philippine material is very homogeneous and the single New Guinea specimen (Carr. 11453) differs slightly in being more strongly and longer hairy; in this it would approach the closely allied Australian *P. archeri* F. v. M. which Mueller himself sunk in *P. badocana* (Bentham,

l.c.), but which Bentham kept separate as a very nearly allied species; Bentham keyed it out on account of its toothed leaflets but the teeth are indistinct in the Papuan specimen of which the flowers are unfortunately in an immature state. As I have insufficient Australian material I have referred it tentatively to *P. badocana*.

4. PSORALEA CORYLIFOLIA Linné

Psoralea corylifolia Linné, Sp. Pl. 764. 1753; Burm., Fl. Ind. 172, *t. 49 f. 2.* 1768; Roxb., Fl. Ind. ed. Carey 3: 387. 1832; Teysm. & Binnend., Cat. Hort. Bog. 256. 1866; Hook., Fl. Br. Ind. 2: 103. 1879; Gagnep., Fl. Gén. I-C. 2: 307. 1920; Burkill, Dict. Ec. Prod. Mal. Pen. 1820. 1935; Backer, Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 5. 1941.

DISTRIBUTION. — Native in India, Burma, Indo-China; introduced in East Java (Sf. Kedawung, Res. Pasuruan) along a sugar-cane field, first found by H. Altmann, a. 1936, only in a local spot; formerly cultivated in the Botanic Gardens, Bogor. According to Burkill grown on several occasions in the Singapore Botanic Gardens, but not established as a weed.

DOUBTFUL SPECIES

Psoralea gaudichaudiana Decne *in* Nouv. Ann. Mus. Par. 3: 467. 1834 (*non vidi*) Herb. Timor. 139. 1835; Miq., Fl. Ind. Bat. 1, 1: 317. 1855.

DISTRIBUTION. — Malaysia: Lesser Sunda Islands: Timor.

Only known from the type specimen, which could not be located in the Paris Herbarium. According to Decaisne the type was in a bad condition when he received it; he wrote: "le *P. gaudichaudii* (sic) a souffert de son immersion dans l'eau de mer par suite du naufrage de M. Gaudichaud, qui l'a rapportée de Timor; il nous a été très difficile de pouvoir l' analyser". I have not succeeded in placing it. It would appear likely to belong to *P. tamborensis* but its calyx measured only 2 mm. the corolla is smaller than the calyx, the wings are longer than the keel, and the petiolules are densely hairy; in *P. tamborensis* the calyx is 6-8 mm long, the corolla exceeds the calyx, the wings are shorter than the keel, and the petiolules are not more hairy than the other parts of the leaf. These discrepancies may appear to be due to the inadequacy of the material.

PSEUDARTHRIA W. & A.

This differs from *Desmodium* in that the pod does not fall apart into joints. Several species are found in Africa; in Malaysia there is only one which it shares with tropical SE. Asia, from Pondichery to Indochina.

The occurrence of it is strictly bound to a seasonal climate, but indeed it has been found twice on the Sunda shelf, *viz* one in Sabang, P. Weh (N. Sumatra), a harbour on a small islet where ships used to bunker. The second locality on the wet Sunda shelf is the islet of Semakau, Singapore, where it has been found once recently by J. Sinclair on the west side. I assume it is adventious in both places.

Its natural area is that of a typical drought-resistant plant, although also in the Moluccas it might be here and there adventive.

PSEUDARTHRIA VISCIDA (L.) W. & A.

Pseudarthria viscida (L.) W. & A., Prod. 209. 1834; Wight, Ic. *t. 286*. 1840; Zoll. in Nat. Geneesk. Arch. Ned. Ind. 3: 63. 1846; Merr. *in* Philip. J. Sc. 5: Bot. 90. 1910; Back., Schoolfl. Java 346. 1911; Merr., En. Philip. 2: 291. 1923; Back., Bekn. Fl. Java (em. ed.) 5: fam. 120, p. 87. 1941. — *Hedysarum viscidum* Linné, Sp. Pl. 747. 1753. — *Desmodium viscidum* DC., Prod. 2: 336. 1825. — *Desmodium timoriense* DC., Prod. 2: 337. 1825; Miq., Fl. Ind. Bat. 1, 1: 245. 1855. — *P. timorensis* Z. & M. *in* Nat. Geneesk. Arch. Ned. Ind. 3: 63. 1846, *nomen* (Zoll. 2771). — *P. gyroides* Z. & M. *in* Nat. Geneesk. Arch. Ned. Ind. 3: 63. 1846, *nomen* (Zoll. 210).

DISTRIBUTION. — Ceylon, India, Pakistan, Burma, and Central Malaysia: E. Java, Bawean I., Lesser Sunda Islands (Bali, Lombok, Flores, Timor, Wetar), S.-Central Celebes, and Moluccas (Halmahera, Sula, Buru, Ceram, Ambon, Banda, Key Is.).

EXCLUDED SPECIES

Pseudarthria polycarpa Hassk., Cat. Hort. Bog. 282. 1844; Pl. Jav. Rar. 393. 1858 = *Desmodium polycarpum* (L.) DC.

Pseudarthria polycarpa (non Hassk.) Zoll. *in* Nat. Geneesk. Arch. Ned. Ind. 3: 63. 1846, *nomen* (Zoll 299 in L) = *Desmodium gyroides* (L.) DC.

Pseudarthria capitata Hassk., Cat. Hort. Bog. 281. 1844; Pl. Jav. Rar. 390. 1858 = *Desmodium capitatum* DC.

SOPHORA LONGIPES Merr.

Sophora longipes Merr. *in* Philip. J. Sc. 12: Bot. 270. 1917; Steen. *in* Bull. Jard. Bot. Btzg III, 17: 424. 1948.

Except for *S. tomentosa* L. the species of this genus are exceedingly rare in Malaysia and among them two endemic species have been described, both from the Philippines (Steen., *l.c.* 421-428). Somewhat to my surprise

it has appeared that one of them, *S. longipes* Merr., was represented amon the collection I made in Portuguese Timor, 1953. It was found in an eve wet patch of forest on the southern escarpment of the limestone platea between Baucau and Veimassi, between 350—100 m altitude. The spe mens, which were erroneously distributed as *Tephrosia sp.*, neatly matc those of the Philippines, save for the slightly smaller leaflets which, thou glabrous to the naked eye, appear under the lens to be very laxly appresse hairy underneath. The field notes run: van Steenis 18061: herb on a pr mitive field in forest patch; pedicel and calyx base dark violet; calyx an corolla paler save a dark patch on the base of the vexillum; pods constric ed between the seeds.

TEPHROSIA L.

TEPHROSIA MACULATA Merr. & Perry

Tephrosia maculata Merr. & Perry *in* J. Arn. Arb. 23: 401. 1942. — *T. br chystachys* Laut. & K. Sch., Fl. Deut. Schutzgeb. Südsee 353. 1901, *non* T. *br chystachya* DC., Prod. 2: 249. 1825, *nec* DC., *ibid.* 253. — *T. confertiflora* (*non* Bth. Val., Pl. Pap. 17. 1907; Pulle *in* Nova Guinea 8: 375. 1910.

The epithet *brachystachya* was occupied twice, by De Candolle, base on different types, and was hence pre-empted when Lauterbach & K Schumann used it for the third time.

In the Rijksherbarium some Papuan sheets have been identified b Miss Amshoff as *T. obovata* Merr. (*in* Philip. J. Sc. 5: Bot. 69. 1910), a species described from the Philippines; there are, however, so many point of difference that we cannot accept her reduction, although we can rely only on Merrill's description for the interpretation of the Philippine spe cies: leaves and leaflets small (7—10 by 5—7 mm), the leaflets crowded with glabrous upper surface; stems glabrous, stipules 2 mm; racemes as long as the leaves; seeds 5—8; pods puberulous.

These characters are for the Papuan specimens: leaves not small leaflets not crowded (2—3 cm long), upper surface of leaflets appressed laxly sericeous; stems angular, distinctly hairy, densely so on the ribs; stipules 3—4 mm; rachis of raceme almost absent, the flowers being mor or less fascicled; seeds 4—5; pods appressed- or patent short-pubescent. The plants make a greyish appearance.

DISTRIBUTION. & ECOLOGY. — The species seems to be bound to low land seasonal climatic conditions and feels at home in secondary grassland and *Tristania* savannah forest, and is obviously not known outside New Guinea.

SPECIMENS EXAMINED. — *Brass 6546, 7546,* (*3703,* not seen); *Branderhorst* [illegible], *1854; Koch 694; Jeswiet 100; N. G. F. 2895.*

NOTES. — The material is very uniform, but only the collection of Jeswiet exactly tallies with the description of the type, in which the pods and stems are covered by a short patent or even somewhat reflexed pubescence; in all other specimens cited the indument is appressed, also on the upper surface of the leaflets. I could not find other differences and regard the discrepancy in the indument as of slight value.

TEPHROSIA ZOLLINGERI Backer

Tephrosia zollingeri Backer *in* Bull. Jard. Bot. Btzg III, 16: 110. 1939. — *Kiesera gracilis* Miq., Fl. Ind. Bat. 1, 1: 291. 1855, *non Tephrosia gracilis* Nutt. 1818.

SPECIMENS EXAMINED. — Java: Banjumas, pr. Sempor, 80 m, 10—5—1935: *R. Brinkman 635.* Lesser Sunda Islands: Sumbawa, Bima: *Reinwardt 1439.* Celebes: Saleyer I.: *Zollinger 3321* (type). Moluccas: Key *Is.*: *Jaheri s.n.* Cultivated specimens in Hort. Bog. under *XV. J. A. XXI. 5* and *XV. K. A. XXXII. 10;* already in cultivation in 1869 under the erroneous name *T. purpurea* (in herb. Hasskarl); also cultivated by the General Agricultural Exp. Station, Bogor, at Tjiapoes sub *n. 814,* dd. 1941; used as green manure in Celebes (*Monod de Froideville* 326).

NOTES. — Some specimens formerly cultivated in the Botanic Garden, Bogor, said to have been received from India, and named *T. cathartica* (Sess. & Moc.) Urban, were found to be conspecific with the Malaysian species. Through the very kind help of Miss D. Hillcoat, of the British Museum, London, we could compare it with a sheet of the true *T. cathartica* from Porto Rico (Sintenis 5657); this is an entirely different plant and apparently the Bogor specimens have been misnamed or misnumbered.

The species is very characteristic with a fine-reticulate, red venation on both surfaces of the leaflets.

Tephrosia papuana Stemmerik, *nom. nov.*

Tephrosia mollis Valeton *in* Bull. Dép. Agric. Ind. Néerl. 10: 17. 1907 (type in L), *non Tephrosia mollis* H. B. K., Nov. Gen. Sp. 6: 463. 1824.

NOTE. — This species requires a new name as the epithet mollis was occupied at the time of Valeton's description. I have not succeeded in matching it with another species from Malaysia.

CORRECTIONS TO THE FIRST INSTALMENT

Unfortunately some errors have crept in the first instalment, *viz*: page 431, line 8 from top, add: Ridley in Kew Bull. 277. 1938;

page 433: after 1. MOGHANIA STROBILIFERA, read: (L.) O. Kuntze.
page 433: line 17 from bottom, read: 746. 1753.
page 434: line 15 from top, read: *Hedysarum lineatum* L., Syst. Nat.
10: 1170. 1759.
page 434: line 16 from top, after *Flemingia lineata* Roxb., insert: *ex*
f. Hort. Kew. (ed. 2) 4: 350. 1812.
page 434: line 17 from top, omit: *nomen.*
page 439: line 15 from bottom, replace 1020 by 726.
page 441: in lines 7 and 8 from top, after viscosa, omit:
(Roth), and leave DC. as single author.
page 441: line 12, behind 1821, add:; *non* Moench. 1802, *nom.*
Through this earlier homonym the name *Rhynchosia viscosa* is
legitimate if it is considered to represent a *nomen novum* of De C
dolle.
page 449: Under *Stylosanthes* the impression may be gained that the ge
has not been found in New Guinea. As a matter of fact these reco
were intentionally omitted as no material was extant at Leyden a
with the uncertainty in former identifications in this genus it
deemed necessary to have them re-examined. The references a
Stylosanthes mucronata Willd.: Lane-Poole, For. Res. Papua
1925; C.T. White & Francis *in* Proc. R. Soc. Queensl. 38: 232 1927.